What is claimed is:

1. A method of polymerizing an aromatic monomer, comprising combining an aromatic monomer with a hematin catalyst, wherein the hematin catalyst has been derivatized with one or more non-proteinaceous amphipathic groups.

2. The method of Claim 1, further comprising combining a peroxide initiator with the aromatic monomer and the derivatized hematin.

3. The method of Claim 2, further comprising a template, wherein the aromatic monomer aligns along the template and polymerizes to form a complex comprising the polymerized aromatic monomer and the template.

4. The method of Claim 3, wherein the template is a polyelectrolyte.

5. The method of Claim 4, wherein the polyelectrolyte is polyanionic.

6. The method of Claim 5, wherein the polyanionic polyelectrolyte is poly(styrene sulfonic acid) or a salt thereof.

7. The method of Claim 3, wherein the template is optically active.

8. The method of Claim 7, wherein the optically active template is an oligonucleotide or a polynucleic acid or a salt thereof.

9. The method of Claim 8, wherein the polynucleic acid is 2'-deoxyribonucleic acid or a salt thereof.

10. The method of Claim 3, wherein the template is lignin sulfonic acid or a salt thereof.

11. The method of Claim 3, wherein the template is dodecylbenzene sulfonic acid or a salt thereof.

12. The method of Claim 1, wherein the aromatic monomer is a substituted or unsubstituted aromatic compound.

13. The method of Claim 12, wherein the aromatic compound is an aniline.

14. The method of Claim 13, wherein the aniline is 2-methoxy-5 methylaniline.

15. The method of Claim 12, wherein the aromatic compound is a phenol.

16. The method of Claim 13, wherein the complex formed is a water-soluble complex of a polyaniline and the template.

17. The method of Claim 16, wherein the polyaniline is of an electrically-conducting emeraldine salt form.

18. The method of Claim 15, wherein the complex formed is a water-soluble complex of polyphenol and the template.

19. The method of Claim 3, wherein the polymerized aromatic monomer complexed to the template has a macro-asymmetry.

20. A method for polymerization of an electroactive polymer, the method comprising the steps of

dissolving polystyrene sulfonate in deionized water at a pH of 1.0-2.0 to produce a solution;

adding polyethylene glycol-hematin to the solution;

adding hydrogen peroxide in small increments to the solution;

stirring the solution to complete polymerization;

effecting dialysis of the polymerized material; and

drying the material under a vacuum.

21. The method in accordance with claim 20 wherein the dried material exhibits a gravimetric yield of at least about 95%.

22. The method in accordance with claim 20 wherein the polymer comprises pyrrole.

23. The method in accordance with claim 20 wherein the polymer comprises poly (3,4)-ethylenedioxythiophene.

24. The method in accordance with claim 20 wherein the polymer comprises pyrrole and (3,4)-ethylenedioxythiophene, each at a concentration of about 0.2 mM.

25. The method in accordance with claim 20 wherein the polymer comprises pyrrole and aniline, each at a concentration of about 0.2 mM.

26. The method in accordance with claim 20 wherein the polymer comprises aniline and (3,4)-ethylenedioxythiophene.

27. The method in accordance with claim 20 wherein the polymer comprises pyrrole, aniline and (3,4)-ethylenedioxythiophene, each at a concentration of about 0.2 mM.

28. The method in accordance with claim 22 wherein the pH is about 2.0.

29. The method in accordance with claim 23 wherein the pH is about 1.0.

30. The method in accordance with claim 24 wherein the pH is about 1.0.

31. The method in accordance with claim 24 wherein the pH is about 2.0.

32. The method in accordance with claim 25 wherein the pH is about 2.0.

33. The method in accordance with claim 26 wherein the pH is about 2.0.

34. The method in accordance with claim 27 wherein the pH is about 2.0.

35. The method in accordance with claim 30 wherein conductivity of the dried material is in the range of 0.1 - 1.0 S/cm.

36. The method in accordance with claim 31 wherein the drying of the material is undertaken at about 60°C and conductivity of the dried material is in the range of 0.1-1.0 S/cm.

37. A method of preparing a derivatized hematin, the method comprising reacting hematin with one or more amphipathic compounds, thereby forming the derivatized hematin.

38. The method of Claim 37, wherein the hematin is reacted with one or more amphipathic compounds in the presence of a carboxylic acid activating compound and an aprotic base.

39. The method of Claim 38, wherein the carboxylic acid activating compound is a dialkylcarbodiimide.

40. The method of Claim 37, wherein the amphipathic compound is a substituted or unsubstituted polyalkylene glycol.

41. The method of Claim 40, wherein the polyalkylene glycol is polyethylene glycol.